



# **TECHNICAL REPORT ON STUDENT INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)**

UNDERTAKEN AT  
**FLORA SOIL NUTRIENT LIMITED**  
KM7 AFON ROAD, ILORIN, KWARA STATE

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## ACKNOWLEDGEMENT

I wish to register my profound gratitude to Allah Almighty for the guidance and grace throughout my life.

My appreciation goes to the entire staff of **FLORA SOIL NUTRIENT LIMITED** for making industrial training interesting educative and worthwhile. My appreciation also goes to my industrial based supervisor, whose accessibility. Unitary effort, patient and guidance and suggestion fabulously contribution to the completion of this report, may God continue to guide and protect them and their family.

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SIWES COORDINATOR

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DATE

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SIWES SUPERVISOR

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DATE

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## **CHAPTER ONE**

### **1.0 INTRODUCTION OF SIWES**

SIWES simply refer to students industry work experience scheme, is a skill training programme designed to expose and prepare students of universities, polytechnics, college of technology, colleges of agriculture and colleges of education for the industrial work experience they are likely to meet after graduation. The programme also affords student the opportunity of familiarizing and exposing themselves to the needed experience in handling equipment and machinery that are usually not available in their institutions.

Before the establishment of the scheme, there was a growing concern among industrialist that graduates of tertiary institution lacked adequate practical background preparatory for employment in industries. That is, the employers were of the opinion that the theoretical education going on in institutions for initiating and designing the scheme by the fund during its formative years 19673 – 94 was introduced to acquaint student with skill of handling employers and machinery.

### **1.1 AIMS OF SIWES**

- ✓ To expose students of higher place of learning to the practical aspects of what they are being taught in school and prepare them for future work related experiences.

### **1.2 OBJECTIVES OF SIWES**

- ✓ To prepare for the industrial work experience they are to undergo after graduation

- ✓ To expose student to work method and techniques in handling equipment and machinery that may not available in their institution.
- ✓ To provide student opportunity to see the world of theirs.

## **CHAPTER TWO**

### **2.0 BACKGROUND HISTORY OF THE ESTABLISHMENT**

#### **2.1 HISTORY OF FLORA SOIL NUTRIENT LIMITED**

Flora Soil Nutrient Limited is a subsidiary of Henry Spencer Company, is strategically located at KM7 Afon Road, Ilorin, Kwara State.

Founded in November 2023, the company was established with a clear vision: to enhance agricultural productivity across Nigeria by providing high-quality, sustainable fertilizers. Recognizing the pivotal role of soil fertility in achieving food security, Flora Fertilizer remains committed to delivering innovative solutions tailored to the diverse needs of farmers.

Under the dynamic leadership of Managing Director Sir Henry Stephen Adebola, a seasoned agribusiness expert and visionary entrepreneur, the company quickly gained a reputation for excellence. His focus on research and development has been instrumental in steering the company towards producing effective and eco-friendly fertilizers. This commitment to sustainability has shaped Flora Fertilizer's approach, with best practices in soil nutrition being a core part of its operations — helping farmers achieve higher yields while minimizing environmental impact.

#### **2.2 TRANSITION FERTILIZER PRODUCTION AND EXPANSION**

Flora Fertilizer's journey began with a deep understanding of the agricultural landscape and the pressing need for soil enrichment solutions. Leveraging extensive research and collaboration with agricultural experts, the company transitioned into full-scale fertilizer production, developing both organic and inorganic blends to address various soil deficiencies. By conducting regular soil analyses, Flora Fertilizer ensures that its products are optimized for Nigeria's diverse agro-ecological zones, meeting the highest industry standards.

Driven by a mission to make high-quality fertilizers accessible, Flora Fertilizer has actively pursued expansion beyond Kwara State. The company has forged strategic partnerships with government bodies, agricultural cooperatives, and private organizations to distribute its products nationwide. This growing network ensures that farmers across the country, regardless of their location, can access affordable and effective soil-enrichment solutions..

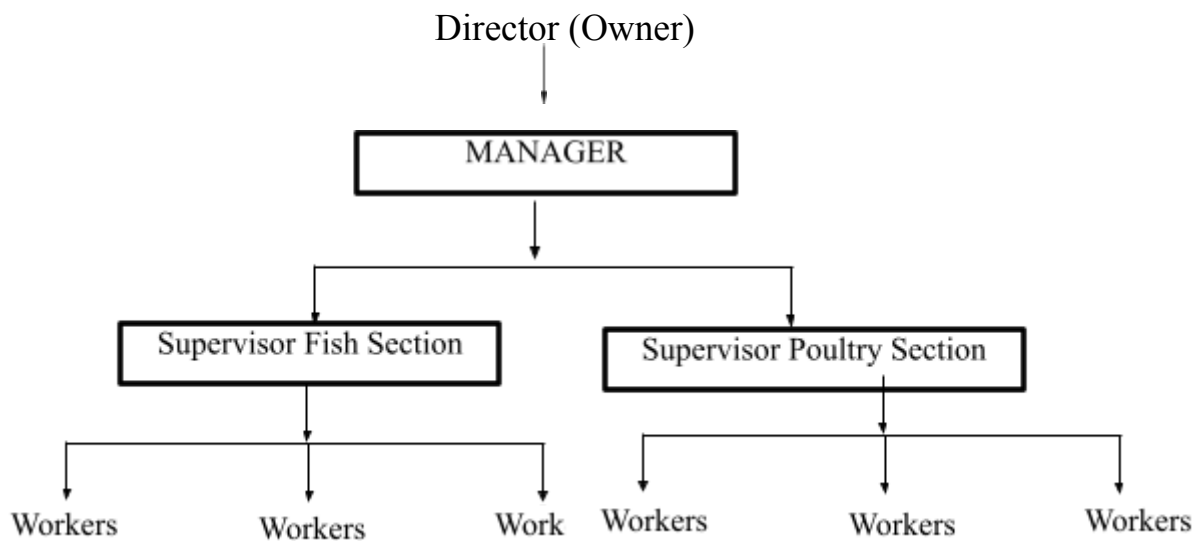
## **2.3 IMPACT ON THE AGRICULTURAL SECTOR**

Beyond production and distribution, Flora Fertilizer has made a significant impact on the agricultural sector through education and capacity-building initiatives. Understanding that proper fertilizer application is key to maximizing crop yields, the company organizes workshops and seminars to train farmers on best practices, application techniques, and timing. These programs have equipped thousands of farmers with practical knowledge, leading to increased productivity and improved livelihoods.



Flora Fertilizer's contributions extend to community development and environmental sustainability. The company invests in local agricultural projects, supports youth empowerment programs, and promotes conservation practices to encourage long-term ecological balance. By aligning business growth with social responsibility, Flora Fertilizer is not only boosting Nigeria's agricultural output but also fostering resilient farming communities.

## 2.4 ORGANOGRAM



## CHAPTER THREE

### 3.1 TECHNICAL TRAINING EXPERIENCE

During my SIWES placement at Forescraft Phase I and II, I gained hands-on experience in fertilizer production and application, which played a critical role in understanding soil health and plant nutrition. The training exposed me to various technical aspects of fertilizer formulation, types, application methods, and their impact on crop growth.

Division / unit/ section

- i. Fertilizer unit / section

### 3.2 FERTILIZER UNIT

In the fertilizer unit, we were trained on several core aspects of fertilizer production and its agricultural significance, including:

- Type of Fertilizers
- Raw Material Sourcing and Processing
- Fertilizer Fomulation and Blending
- Soil Testing and Analysis
- Application Techniques

❖ **Fertilizer**: is a substance that adds nutrients to the soil to enhance plant growth and increase crop yields.

#### **Fertilizer application Techniques**

We learned that proper application methods are critical to maximizing crop growth and minimizing nutrient loss. The training covered:

- i. Broadcasting: Spreading fertilizer evenly across the soil surface
- ii. Side-dressing: Applying fertilizer along the sides of growing crops
- iii. Foliar feeding: Spraying liquid fertilizer directly on plant leaves for quick nutrient absorption
- iv. Drip irrigation feeding: Delivering dissolved fertilizers through irrigation systems for efficient root uptake

### **Soil Testing and Nutrient Management**

Soil testing was an essential part of our training. We learned how to:

Collect soil samples and analyze nutrient levels

Interpret soil test results to recommend suitable fertilizers

Adjust fertilizer formulas based on specific soil deficiencies

### **Impact on Crop Growth and Productivity**

The practical sessions included observing test plots where different fertilizer treatments were applied. We monitored plant growth, assessed leaf color and size, and measured yield differences. The results demonstrated how balanced

fertilization significantly boosts crop output and improves plant resilience against pests and diseases.

### **Sustainable Practices and Environmental Care**

The training also highlighted the environmental aspects of fertilizer use. We explored practices to mitigate negative impacts, such as:

Using slow-release fertilizers to reduce leaching and runoff

Incorporating organic fertilizers to improve soil structure and microbial activity

Educating farmers on proper fertilizer handling and storage to prevent contamination



### **Fertilizer Application for Different Crop Stages**

Just like fish feed varies by growth stage, fertilizer needs change as crops grow:

Seedling stage: High-phosphorus fertilizers to promote root development

Vegetative stage: Nitrogen-rich fertilizers for leafy growth

Flowering stage: Balanced NPK fertilizers to support flower and fruit formation

Maturity stage: Potassium-heavy fertilizers to improve fruit quality and disease resistance

### **Fertilizer Timing and Crop Stages**

Seedling Stage: Use phosphorus-rich fertilizers to promote root development

Vegetative Stage: Apply nitrogen-heavy fertilizers for vigorous leaf growth

Flowering Stage: Use balanced NPK fertilizers to support blooms and fruit setting

Fruiting/Maturity Stage: Increase potassium to improve fruit size, taste, and shelf life

### **Benefits of Fertilizer Use**

Increases crop yields and food production

Improves plant health and resistance to pests/diseases

Replenishes soil nutrients depleted by continuous farming

Supports large-scale, commercial farming operations

## **Environmental Impact and Sustainable Practices**

While fertilizers boost productivity, improper use can harm the environment:

Nutrient Runoff: Excess nutrients can wash into water bodies, causing algal blooms and water pollution

Soil Degradation: Overuse of chemical fertilizers can lower soil pH, reduce organic matter, and kill beneficial microbes

Greenhouse Gas Emissions: Nitrogen fertilizers can release nitrous oxide, a potent greenhouse gas

Sustainable Solutions:

Using organic and biofertilizers to reduce chemical dependence

Practicing precision farming to apply the right amount of fertilizer at the right time

Rotating crops and using cover crops to naturally enrich the soil

## **The Future of Fertilizers**

Innovations in fertilizer technology aim to make farming more efficient and eco-friendly:

Nano-Fertilizers: Deliver nutrients at the molecular level for maximum absorption



Microbial Inoculants: Enhance soil biology to improve nutrient cycling

Smart Fertilizers: Release nutrients in response to soil conditions (e.g., moisture, pH)



## **CHAPTER FOUR**

### **4.1 FERTILIZER PRODUCTION AND BLENDING OPERATIONS UNIT**

Fertilizer production is a critical aspect of modern agriculture, as it directly influences crop yields and food security. In blending operations, various raw materials are combined to create nutrient-balanced fertilizers that cater to specific crop needs. This unit covers the production process, types of fertilizers, challenges, and best practices for sustainable production.

### **UNDERSTANDING FERTILIZERS**



Fertilizers are substances added to soil or plants to supply essential nutrients that enhance growth and productivity. The three primary nutrients are:

Nitrogen (N): Encourages leafy and vegetative growth.

Phosphorus (P): Promotes root development, flowering, and fruit production.

Potassium (K): Enhances plant strength, drought resistance, and disease tolerance.

Blended fertilizers, like NPK blends, combine these nutrients in varying ratios to meet different crop requirements.

## **THE PRODUCTION PROCESS**

The fertilizer production process involves several key stages:

1. Raw Material Sourcing: Obtaining materials like urea (N), phosphate rock (P), and potash (K).
2. Weighing and Proportioning: Measuring each nutrient accurately based on the desired blend ratio.
3. Blending: Mixing the ingredients uniformly using specialized blending machines.
4. Granulation (if needed): Converting the mixture into granules for easier application and better soil absorption.
5. Quality Control: Testing the final product for nutrient accuracy and consistency.

6. Storage and Packaging: Storing in moisture-free conditions and packaging in labeled bags (usually 25 kg or 50 kg).

## **TYPES OF NPK FERTILIZERS AND THEIR USES**

Different NPK blends are tailored to specific crops and soil requirements:

20-10-10: Ideal for maize production due to its balanced nitrogen content.

15-15-15: Commonly used for cassava and other root crops.

20-10-5+S: Suitable for legumes needing sulfur for protein synthesis.

3-3-45+2Mg+B: A specialized blend for oil palm, boosting fruit production with added magnesium and boron.

Each variant serves a unique function, ensuring plants receive the right nutrients at the right growth stage.

## **CHALLENGES FACED IN PRODUCTION**

Despite its benefits, fertilizer production comes with several challenges:

Moisture Absorption: Fertilizers, especially urea, absorb moisture, causing caking and nutrient loss.

Machine Breakdowns: Regular wear and tear can disrupt blending operations.

Raw Material Shortages: Supply chain disruptions can delay production schedules.

## **SOLUTIONS AND BEST PRACTICES**

To overcome these challenges, producers can implement several solutions:

Improved Storage: Use airtight bags and dry warehouses to prevent moisture damage.

Routine Maintenance: Regularly service blending and packaging machines to prevent unexpected breakdowns.

Diversified Sourcing: Procure raw materials from multiple suppliers to ensure consistent availability.

## **THE ROLE OF FERTILIZERS IN SUSTAINABLE AGRICULTURE**

When used correctly, fertilizers enhance soil fertility and boost crop yields. However, excessive or improper use can lead to environmental issues like soil degradation, water pollution, and greenhouse gas emissions. Sustainable practices include:

Precision Application: Applying the right amount of fertilizer at the right time to avoid nutrient runoff.

Organic Integration: Combining synthetic fertilizers with organic matter to improve soil health.

Soil Testing: Regularly analyzing soil nutrient levels to guide fertilization decisions.

## **CHAPTER FIVE**

### **RECOMMENDATION AND CONCLUSION**

#### **RECOMMENDATION**

SIWES Programme is an interested practical and working experience which facilitate familiarity with working act, tools and machinery handling for student such graduate and under graduate with these view. It is highly recommend that federal governments should fund the programme for more better efficiency.

#### **CONCLUSION**

In conclusion SIWES programme it's what of continuity with strong monitoring by the (ITF) officers and various higher places of learning to make sure that their students are fully participate in the programme for better working experience for great better nation ahead.